

## Biological Control Investigations on Insect, Snail and Weed Pests in Tropical America, 1961

N. L. H. KRAUSS

STATE DEPARTMENT OF AGRICULTURE  
HONOLULU, HAWAII

(Submitted for publication December, 1961)

Investigations on biological control of various pests of Hawaiian agriculture made by the author in tropical America during the period March-December 1961 are briefly summarized in this paper. Most of the work was done in Brazil, but shorter periods were spent in Mexico, Panama, Uruguay, Argentina, Chile, Colombia and Peru.

Among the persons who aided me in this work I would like especially to mention Eleazar Jimenez Jimenez of the Secretaria de Agricultura y Ganaderia, Mexico City; Harry L. Maltby, U.S. Entomology Research Division, Mexico City; Jose Pinto da Fonseca, Instituto Biologico, Sao Paulo, Brazil; and Padre Guillermo Kuschel, Universidad de Chile. Identifications of most of the insects were made by specialists of the Entomology Research Division, U.S. Department of Agriculture.

The beneficial insects sent to Hawaii were received, propagated, and tested by C. J. Davis, H. K. Nakao, Mabel Chong, and other members of the Entomology Branch, State Department of Agriculture.

### INSECT PESTS

**Agromyzid Leafminers.** On the coast of Sao Paulo state, Brazil, at Santos, Sao Vicente and Guaruja Island, leaves of *Bidens pilosa*, *Ageratum conyzoides*, and other composite weeds were found infested by several species of agromyzid fly larvae which form blotch mines. The agromyzids were identified as *Phytobia* (*Calcomyza*) *allecta* (Melander), *Phytobia* (*Amauromyza*) *maculosa* (Malloch) and *Liriomyza* sp. by K. A. Spencer. Several shipments of infested leaves were sent to Honolulu during the period June-October and these yielded the parasites *Opius* sp. near *oscinidis* Ashmead, *Opius* sp., (Braconidae) and the eulophids *Chrysocharis majoriani* Girault and *Achrysocharis* sp. The first releases of these parasites were made in June, on Oahu.

**Scales.** *Lecanium* scales on *Schinus terebinthifolius* branches were found to be attacked by caterpillars of the predacious phycitid *Baphalia homoeosomella* (Zeller) at Maua, Sao Paulo, Brazil. Several shipments of these were sent to Honolulu in April and June but it was not possible to propagate the moths there. The following parasites were reared from the material: *Apanteles* sp. near *alexanderi*

Brethes (Braconidae), *Arachnophaga* sp. (Eupelmidae) and *Coccidoxenus* sp. (Encyrtidae). The *Coccidoxenus* probably emerged from the scale.

#### SNAIL PESTS

A number of adult and young individuals of the predacious snail *Streptaxis contusus* (Ferussac) (family Streptaxidae) were obtained in Rio de Janeiro through the kind cooperation of Dr. Hugo de Sousa Lopes of the Instituto Oswaldo Cruz. Shells of the adults are about 22 mm. in diameter, more flattened than those of the two species of *Gonaxis* introduced into Hawaii from Africa, and of a creamish color; the bodies are orange-yellow. In the Rio area this predator attacks snails of the genera *Bradybaena*, *Bulimulus*, *Thaumastus*, etc. in forested areas. The snails were forwarded to Honolulu and 18 were released at Kapaa, Kauai on May 24 against ground snail pests (*Bradybaena*, etc.).

#### WEEDS

**Christmas Berry** (*Schinus terebinthifolius*). This ornamental plant, a shrub or small tree of the family Anacardiaceae, is native to Brazil, Paraguay and northern Argentina. In Hawaii it has become a serious rangeland pest, especially on the island of Hawaii. The following insects were among the more important species found attacking *Schinus* spp. in South America. All the records are from *S. terebinthifolius* unless otherwise noted.

*Bruchus atronotatus* Pic. This bruchid which attacks the seeds was sent in large numbers to Hawaii in 1954 by the author, but propagation was not successful. Many adults were released on Oahu and Hawaii in 1960 from shipments collected in Sao Paulo state, Brazil by Dr. Jose Pinto da Fonseca. This year the beetles were scarce, but several hundred were sent to Honolulu and these were released in Kau, Hawaii in April. This species is not known to be established in Hawaii.

*Lithraeus electus* Bridwell (Bruchidae). This beetle was bred from seeds of *Schinus latifolius* collected at Las Cruces, near Cartagena, Chile in April and May.

*Procalus mutans viridis* (Philippi). The larvae and adults feed on leaves of *Schinus latifolius* at Las Cruces and Algarrobo, Chile. The eggs are laid in clusters on the leaves. Both larvae and adults are green. Three shipments of eggs, larvae, and adults were sent to Honolulu but propagation is proving difficult.

*Crasimorpha* sp. The spotted larvae of this gelechiid form elongate galls on the twigs, usually near the tip, on plants growing among sand dunes at the beach of Recreio dos Bandeirantes, near Rio de Janeiro. A few larvae were collected at Maua, Sao Paulo state. Several lots were sent to Honolulu and the first release was made in Kau, Hawaii in December.

*Hylesia* sp. The spiny gray caterpillars of this saturniid were found feeding on leaves at Belo Horizonte, Minas Gerais, Brazil in July. This species was discarded as the larvae bear many highly irritating spines.

Undetermined Lacosomid. The large gray and yellow banded caterpillars web several leaves into individual shelters and feed on the leaves at Curitiba, Parana, Brazil. Two shipments were made to Honolulu for propagation and testing.

*Sibine* sp. near *rufescens* Walker; Limacodidae. These gregarious, slug-like caterpillars were found feeding voraciously on leaves at Itapoan, near Salvador, Bahia, Brazil in October. The larvae are green with tufts of orange spines. This species was also eliminated because of irritating spines. A bombyliid parasite, *Systropus conopoides* Kunckel d'Herculaïs (det. R. H. Painter) was reared from the larvae.

Undetermined spiny black caterpillars with brown "saddles" were feeding on leaves at Itapoan and Salvador, Bahia as well as elsewhere in Brazil (Maua and Sao Vicente in Sao Paulo state, etc.). This is now undergoing feeding tests in Honolulu.

Leafminers. Two species of gracilariid blotch leafminers were found in Brazil: an undetermined species of a genus near *Parornix* at Sao Vicente and Itanhaen, Sao Paulo, which was sent to Honolulu during August-October, but not successfully propagated there, and an apparently new species of *Gracilaria* noted at Salvador, Bahia in October.

*Lantana camara aculeata* insects. (See p.134).